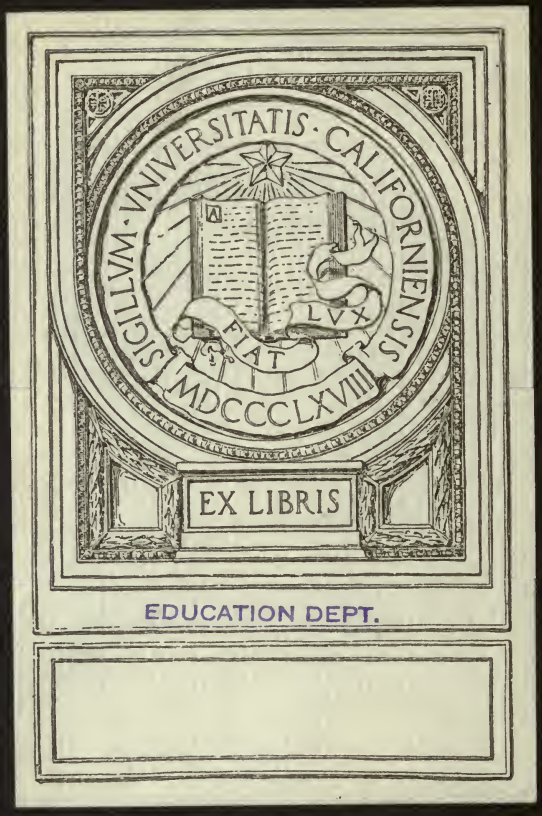

UNIVERSITY OF CALIFORNIA
DEPARTMENT OF EDUCATION

MEASURING CLASSROOM PRODUCTS IN BERKELEY

Study Number 1
of the Bureau of Research in Education

In two Sections—Section I

DECEMBER 1, 1920

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY

PRICE 25 CENTS

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CONTENTS

FOREWORD AND INTRODUCTION

Any program of administration or management which is concerned with securing efficient results with justifiable economy must be based upon reliable facts. This is quite as true in the fields of finance and industry as in educational institutions. Every up to date, progressive business institution has its Department of Efficiency, to which it looks for scientific evaluation of its efforts. Upon the basis of these findings it modifies its programs of operation and procedure from time to time.

Realizing the need of definite information as to what was being accomplished in the public schools of Berkeley, and being without a Department of Research at that time, I sought the coöperation of the Department of Education at the University of California. I found Dean Alexis F. Lange and his associates in the department immediately interested to render service and to avail themselves of the laboratory opportunity thus provided. Accordingly, following two or three conferences, I was able to report to the Board of Education at the regular meeting of October 1, 1918, that tentative arrangements had been made with the faculty of the Education Department of the University of California for the direction by Dr. Cyrus D. Mead, Associate Professor of Elementary Education, of available graduate students in such research work in the public schools of Berkeley as would enable the determination of the results which were being secured in the public schools in the various grades and in the various subjects which might be investigated. The board readily approved the arrangements made by the superintendent, and empowered him to act fully in the matter and to print the results of the study for distribution when they were completed.

The results of this coöperative arrangement have been very satisfactory, indeed, as the published results in the following pages show. Scientific studies were conducted to determine the results which were being secured in Writing, Spelling, Reading, the Fundamentals of Arithmetic, and Reasoning Ability in Arithmetic. Before the second section is ready for publication, it is hoped that it may be possible to add an appendix dealing briefly with the results which are being secured in Composition and Geography.

The value to a school system of such an investigation as this is perhaps three-fold. It is an immediate help to the teacher in diagnosing the difficulties and problems which are confronting her and in enabling

her to find ways and means of solving the same. Second, it provides certain valuable training facilities for these teachers who wish to familiarize themselves with the technique of scientific investigation. Third, it provides accurate, reliable data gathered by scientific methods for the use of the administrative and supervisor force in enabling them to study conditions throughout the system and to make comparisons with other systems. It constitutes the necessary basis for readjusting the emphasis that should be given to different topics and subjects, and for modifying and improving the teaching technique in the interest of better results.

For the service rendered the public schools through this coöperative effort, we are genuinely thankful to the Department of Education of the University of California. It is believed that the publication of these results is desirable not only because of their value to the public schools of Berkeley, but because the methods used and the results indicated will be of interest and service to others.

H. B. Wilson,
Superintendent of Schools,
Berkeley, California.

DEPARTMENT OF EDUCATION
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

LETTER OF TRANSMITTAL

DR. H. B. WILSON,
Superintendent of Schools,
Berkeley, California.

May 28, 1919.

My Dear Dr. Wilson:

In pursuance with your request in September 1918, the members of my Seminar in The Measurement of Elementary School Work undertook as a project a survey of the Berkeley Schools, such survey on their part to include the application of standard tests to the subject matter of the elementary field. The class of men and women in Education gladly accepted this work with the resolution that the teachers of the system as a whole should become an integral part and assist in such survey and that, whatever the findings, there should be included in the report constructive helps and suggestions for the further improvement of teaching in our city schools. We were extremely fortunate in having, as well as graduate students in Education, a number of your progressive principals and teachers. It has given me much pleasure, with no little pride, to watch the growing interest and enthusiasm of this seminar group. They have applied themselves to the work with a zeal and professional spirit which I wish to commend to you. The extension of the class period from two to three hours weekly was but a trifle to the additional hours of work put in throughout the school year. They have done a most careful and thorough piece of work.

It was decided to measure the school products from the second or third grades to the eighth or ninth inclusive in handwriting, spelling, reading, the fundamentals of arithmetic and arithmetical reasoning.[1] The following standard tests were applied or made use of:

Handwriting—AYRES: Gettysburg Scale.
Spelling —AYRES: Measuring Scale for Ability in Spelling.
Reading —MONROE: Standardized Silent Reading Tests.
Arithmetic —COURTIS: Series B Standard Research Tests (Fundamentals).
STARCH: Arithmetical Scale A (Reasoning).

[1] The studies in English Composition and Geography, which are to appear in the Appendix of Section II of the report were made by the 1920–21 Educational Measurements Seminar.

The method of procedure was to study the scales and tests, their derivation, use and applications that had been made. Accompanying this the technique of the statistical method was studied and practiced. A preliminary meeting was held the week or two preceding the giving of each test in which the plan was outlined and the directions carefully formulated. These directions were mimeographed by your office force and mailed to each principal and teacher. Within the day or two following, each seminar student appeared at his group of schools, usually two, in order to meet the teachers in group and explain in detail the giving of the tests. Each test was administered under the direction of the seminar representative but was given by the class teacher. In most instances the marking of the papers was by the teacher. In all cases, however, these gradings were checked and verified by seminar groups. This was tedious work but for uniformity and purposes of comparison it was found necessary. The teachers were most conscientious in their markings but in some instances it was found that there were variations in judgment even when the form of the answer seemed to be explicit.

Practically every pupil in the system participated. All classes were included, there was no selection. This is unusual in that most surveys have made random selections of pupils. In all, we measured from five to six thousand children in each of the tests. This involved the handling of about twenty-five thousand papers. We wish to commend your office force for the efficient assistance they rendered and for the excellent mimeographed forms they supplied for recording our data.

The entire seminar took part in scoring the handwriting samples and in checking and verifying the scores on the various test sheets. Particular subjects however were assigned committees to assemble the data in tabular and graphic form and to make constructive suggestions. The following is a list of committees:

Handwriting—Alex S. Boulware, Supervisor of Penmanship, San Francisco State Normal School, San Francisco.
William F. Ewing, Vice Principal, Oakland Technical High School, Oakland.
A. J. Hamilton, Principal, Washington School, Berkeley.
George C. Kyte, Principal, Emerson School, Berkeley.

Spelling —Mrs. Clara M. Partridge, Principal, Oxford School, Berkeley.
Jeannette Barrows, Principal, Hillside School, Berkeley.
Norma E. LeVeque, Graduate Student, Boulder, Colorado.

Reading —Harry H. Glessner, Principal Edison (Junior High) School, Berkeley.
Bert B. Davis, Normal Director, Walla Walla College, College Place, Washington.
(Mrs. Partridge and Miss Barrows assisting).

Arithmetic (Fundamentals)—

Louis P. Linn, Instructor in Educational Extension, University of California.
Mary B. O'Bannon. Principal of Jefferson School, Berkeley.
Anna O'Bannon, Teacher of Mathematics, McKinley School, Berkeley.

Arithmetic (Reasoning)—

(Misses Anna and Mary O'Bannon and Miss Barrows).

The Seminar also wishes to express its appreciation of the help rendered by the principals and teachers of the system. It was felt that the professional improvement resulting from the teaching force taking a direct hand would more than offset any possible variations in the giving of the tests.

Very truly yours,

Cyrus D. Mead,
Associate Professor of Elementary Education,
University of California.

CHAPTER I

REPORT OF THE COMMITTEE ON HANDWRITING

The first test to be given the children of the Berkeley Schools in the present survey was the test in handwriting. In order to determine the speed and quality of the handwriting of the children it was necessary to obtain samples of a uniform nature produced under conditions as nearly uniform as possible. Since the Gettysburg Edition of the Ayres Handwriting Scale was to be used as a basis for judging the quality of the samples of handwriting, it was deemed wise to use the opening sentences of the Gettysburg Speech as the material for the test.

The following instructions in regard to the test were sent out from the Superintendent's office:

THE PUBLIC SCHOOLS
BERKELEY, CALIFORNIA

BULLETIN No. 24,
December 10, 1918.

DIRECTIONS FOR GIVING HANDWRITING TESTS

To Principals and Teachers:

On Thursday, December 12th, or Friday the 13th, it is desired to secure samples of handwriting from all the pupils in grades two to nine inclusive. A representative of Dr. Mead's Seminar will come to your school on Thursday to assist you in any way. The samples of handwriting should be secured in the following manner:

Each teacher should write on the board in the front of the room, (and the sides also, if desirable), the first three sentences of Lincoln's Gettysburg Address. As a preliminary preparation, the pupils should read and copy this until they are thoroughly familiar with it and practically know it by heart. For the final test, preparations should be made so that all the pupils can begin to copy, and stop, at a given signal. They should be allowed to write for precisely two minutes. Care should be taken with these conditions. It is not likely that any pupil will be able to copy the entire three sentences in the two minutes allowed. See that the papers for each grade are fastened together. They will be scored for both speed and quality.

The writing should be in ink and on ruled paper. Second or third grade pupils may use pencil if not accustomed to ink. Before the test begins, have each pupil write his name, grade, name of school and date on the reverse side of the paper. The teacher should mark in the upper right-hand corner of each the number of letters written by the pupil in the two minutes. The following count of letters will aid in scoring the papers:

Fourscore 9 and 12 seven 17 years 22 ago 25 our 28 fathers 35 brought 42 forth 47 upon 51 this 55 continent 64 a 65 new 68 nation 74 conceived 83 in 85 liberty 92 and 95 dedicated 104 to 106 the 109 proposition 120 that 124 all 127 men 130 are 133 created 140 equal 145.

Now 148 we 150 are 153 engaged 160 in 162 a 163 great 168 civil 173 war 176 testing 183 whether 190 that 194 nation 200 or 202 any 205 nation 211 so 213 conceived 222 and 225 so 227 dedicated 236 can 239 long 243 endure 249. We 251 are 254 met 257 on 259 a 260 great 265 battlefield 276 of 278 that 282 war 285.

Kindly follow the above directions slavishly and absolutely, that there may be no factor entering into the securing of these writing specimens which would render the results impossible to use. These will reach you Wednesday, the day before the representative from Dr. Mead's Seminar expects to visit you. Any question of any character or any detail of procedure should be taken up with this representative at the time of the visit.

Very truly,

H. B. Wilson,
Superintendent of Schools.

Oral Instructions Concerning the Test

Before the test was given members of the Seminar conducting the survey met the teachers of the several schools and explained in detail the technique of giving the test and handling the papers. Especial attention was called to the necessity of measuring accurately the two-minute period which was allowed for the test. So far as can be seen from the pupils' papers, the test was carried out in every way as planned. In many cases children stopped in the middle of a word and often the final letters were left unfinished.

Scoring the Papers

By far the greatest task in connection with this survey of the Berkeley Schools was the problem of training the members of the Seminar in the use of the handwriting scale. Before any of the samples of handwriting written by the Berkeley children could be evaluated for quality

it was necessary to develop a consistency in the use of the scale which would be trustworthy. From the very beginning it was apparent that the judgments of the members of the Seminar in regard to quality values must be standardized before the actual problem of rating the test samples could be undertaken. It was desired that all members of the Seminar participate in this activity so that the final judgments of quality should be a composite judgment rather than a personal judgment as has been the case in most of the surveys of handwriting so far conducted.

Only a few of the members had previously had any experience with work of this character and the results of the first round of practice showed a wide range of values assigned to individual papers. This was found to be true especially with regard to papers which were in any way strikingly different from the samples on the scale. A period of practice was, therefore, entered into which extended over some fifteen weeks, although but eight actual rounds of practice were found to be necessary. A brief statement of the outcome of this period of practice is here given since it is believed the findings of the survey in regard to quality of handwriting will be better appreciated when it is understood with what care these findings were determined.

Uniformity of Judgments as to Quality

After the members of the Seminar had practiced rating papers for several weeks it became apparent that certain members tended to rate high and others low. By careful selection of the rating groups these tendencies were so balanced that the composite judgment of the groups was consistent and uniform with that of the other rating groups. (There were twelve members divided into three groups of four each). The results of the last round of practice before the rating of the test papers was begun is summarized here to show how near to actual uniformity the judgments had become as a result of practice and discussion.

A set of twenty-five papers ranging in quality from very poor to very good was selected for practice. All members of the Seminar rated the papers. Composite judgments were determined for the three groups into which the Seminar had been divided as previously explained. The following table gives the comparison of these composite judgments with the true values:

	Group I	Group II	Group III
Absolute agreement with the true values	12	14	15
Variation of ½ step from the true values	11	11	7
Variation of 1 step from the true values	2	0	3
	25	25	25

When it is understood that a variation of one-half step from the actual value on the scale is considered by competent judges the country over to be of little consequence, it can be seen to what degree the practice work had been effectual in standardizing the evaluation of quality. Out of the seventy-five composite judgments only five were as much as one step away from the true value and no values were assigned showing a greater variation than one step. (The "true" value for each sample was determined by averaging the judgments of the twelve members independently of the rating groups. It is felt that these so-called "true values" would not have been changed so much as a quarter step had the papers been rated by a much larger group of competent judges, hence, there is no hesitancy in accepting them as real or true values.)

When the ability to determine quality of handwriting had been brought to a satisfactory standard the rating of the test papers of the Berkeley children was undertaken. The papers for each class in each school were so divided that a third of them were rated by each of the rating groups. The value assigned to each paper was the composite judgment of one rating group, but the average rating for the class was, after all, a composite of the judgments of the whole seminar.

Tabulation of Results

The following tables give the results of the handwriting test with regard to both speed and quality. A perusal of these tables, and especially of the graphs which accompany them, should prove interesting and helpful to all who are concerned with the educational progress of the children in the Berkeley schools. For the sake of comparison, certain standards of attainment have been placed beside the figures for Berkeley.* The figures for two other school systems have been included as a means of comparison—Richmond, California, and St. Louis, Missouri.

* The achievement in Berkeley Schools has been made under a prescribed weekly minimum time allotment as follows:

	Grade I	Grade II	Grade III	Grade IV	Grade V	Grade VI	Grade VII	Grade VIII
Min. per week	95	75	80	80	80	60	....	....

Table I

Number of Pupils in Each Grade at Each Speed (Letters per Minute)

Berkeley Elementary and Intermediate Schools

Speed	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	9B	9A	Total	Per cent
0–9	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	.17
10	137	80	23	2	2	1	0	0	0	0	0	0	0	0	0	0	245	4.83
20	122	103	84	31	14	11	13	3	0	2	0	0	1	0	0	0	384	7.57
30	37	52	97	90	79	35	40	6	7	2	2	0	0	0	0	0	447	8.81
40	3	21	47	97	113	89	84	26	40	12	6	3	3	1	0	0	545	10.74
50		1	23	55	87	76	85	66	55	29	22	7	8	3	0	1	518	10.21
60		1	10	31	55	65	85	91	78	64	44	18	24	11	1	5	583	11.48
70		1	10	8	36	49	69	82	89	95	84	54	39	28	17	6	667	13.13
80			3	4	11	13	19	53	69	79	84	56	49	31	38	14	523	10.31
90			0	1	0	3	16	22	20	38	57	45	58	43	53	15	371	7.31
100			0		2	3	3	11	14	25	50	38	59	43	55	26	329	6.48
110			1				1	4	3	5	29	17	30	43	33	16	182	3.58
120							1		5	2	12	14	33	29	23	20	139	2.74
130										1	12	6	12	14	20	15	80	1.60
140											6	3	9	16	6	8	48	.94
150																4	4	.08
160																0	0	.00
170																1	1	.02
	306	261	298	319	399	345	416	364	380	354	408	261	325	262	246	131	5075	100.00

Table II

Number of Pupils in Each Grade at Each Quality

Berkeley Elementary and Intermediate Schools

Quality	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	9B	9A	Total	Per cent
10*	2	5	4	1	2	0	0	0	1	1	2	0	0	0	0	0	18	.35
20†	14	11	13	14	11	7	7	4	1	4	8	1	2	2	1	0	100	1.97
25	26	18	31	42	40	22	33	25	27	24	10	8	5	2	3	8	324	6.38
30	94	53	47	73	95	61	69	68	55	58	49	19	33	25	7	6	812	16.01
35	67	65	68	65	111	95	113	74	82	74	82	37	53	45	19	12	1062	20.93
40	77	75	65	62	94	70	94	85	95	66	100	69	75	75	43	26	1171	23.08
45	20	16	36	37	34	50	42	46	56	54	85	57	65	52	60	31	741	14.60
50	5	15	19	14	6	22	33	40	33	37	32	33	41	31	41	20	422	8.31
55	1	2	12	9	4	14	15	15	13	22	19	24	30	20	39	11	250	4.92
60		0	3	2	1	2	7	5	11	7	12	10	14	6	18	8	106	2.08
65		0			1	2	1	2	5	4	8	3	4	4	10	7	51	1.00
70		1					2		1	3	1		3		5	1	17	.35
75																1	1	.02
	306	261	298	319	399	345	416	364	380	354	408	261	325	262	246	131	5075	100.00

* Quality 10 denotes a quality of handwriting below 20, the lowest quality on the Ayres Scale; 10 represents 0—19.9 quality.

† Quality 20 represents qualities from 20 to 24.9.

TABLE III

MEASURES OF CENTRAL TENDENCY FOR THE BERKELEY SCHOOLS[1]

Speed

Grade	Average	Median	Lower Quartile	Upper Quartile	Quartile Range
2B	21.47	20.7	15.07	27.00	11.93
2A	25.46	24.7	17.9	32.07	14.17
3B	36.54	34.3	26.13	44.15	18.02
3A	45.12	43.7	35.20	53.50	18.30
4B	51.21	49.2	40.42	60.77	20.35
4A	55.95	54.8	44.41	67.19	22.78
5B	59.06	58.4	46.07	70.72	24.65
5A	69.67	68.9	58.48	79.87	21.39
6B	71.10	71.1	58.72	82.32	23.60
6A	77.54	77.2	66.80	87.78	20.98
7B	87.84	85.5	73.33	101.40	28.07
7A	90.86	88.7	76.90	103.33	26.43
8B	96.78	96.6	81.27	110.66	29.39
8A	103.21	103.3	87.26	118.49	31.23
9B	104.15	102.5	91.04	116.21	25.17
9A	110.65	109.4	94.50	127.62	33.12

[1] Derived from Table I.

TABLE IV

MEASURES OF CENTRAL TENDENCY FOR THE BERKELEY SCHOOLS[1]

Quality

Grade	Average	Median	Lower Quartile	Upper Quartile	Quartile Range
2B	36.27	38.8	31.83	41.72	9.89
2A	37.98	38.3	32.94	42.91	9.97
3B	39.06	39.0	32.82	44.65	11.83
3A	37.83	37.3	31.55	43.57	12.02
4B	37.16	37.3	32.46	42.14	9.68
4A	40.22	39.3	34.69	48.75	14.06
5B	40.33	39.4	34.64	44.78	10.14
5A	41.13	40.6	34.56	46.85	12.29
6B	41.89	41.2	35.67	47.14	11.47
6A	42.18	41.2	35.88	48.56	12.68
7B	43.09	42.7	37.01	48.23	11.21
7A	45.31	44.7	40.02	50.72	10.70
8B	45.41	44.6	38.89	51.31	12.42
8A	44.58	43.8	39.05	49.56	10.51
9B	49.91	49.1	43.66	56.35	12.69
9A	47.69	47.2	41.30	53.81	12.51

[1] Derived from Table II.

TABLE V

AVERAGE SCORES IN SPEED BY GRADES

Comparative Tables

Grade	Berkeley	*St. Louis	†Richmond	‡Ayres Standard
2	25.5	36.7	.....	31
3	45.1	56.8	39.2	44
4	56.0	64.0	48.4	55
5	69.7	65.6	67.2	64
6	77.6	69.3	80.1	71
7	90.9	74.7	82.8	76
8	103.2	72.8	94.6	79
9	110.6	.....	.....	....

* See No. 8 in Selected Bibliography on Handwriting which is appended to this report.

† Data from an unpublished study made by A. S. Boulware, Geo. C. Kyte, and A. J. Hamilton (1919).

‡ See No. 3 in Selected Bibliography.

TABLE VI

AVERAGE SCORES IN QUALITY BY GRADES

*Comparative Tables**

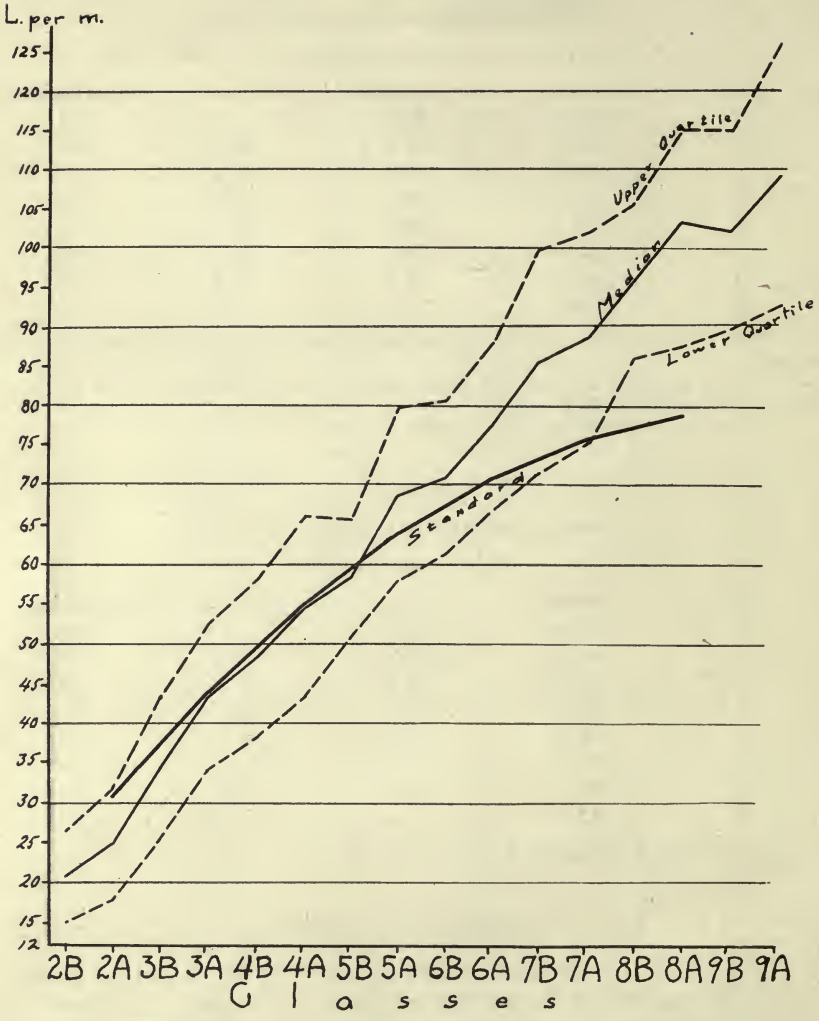
Grade	Berkeley	St. Louis	Richmond	Ayres Standard
2	38.0	29.9	.....	38
3	37.8	31.8	38.4	42
4	40.2	36.7	44.5	46
5	41.1	49.4	56.8	50
6	42.2	57.0	54.3	54
7	45.3	63.4	65.9	58
8	44.6	74.3	67.0	62
9	47.7	.....	.....	....

* See sources of data given in footnotes to Table V.

INTERPRETATION OF DATA

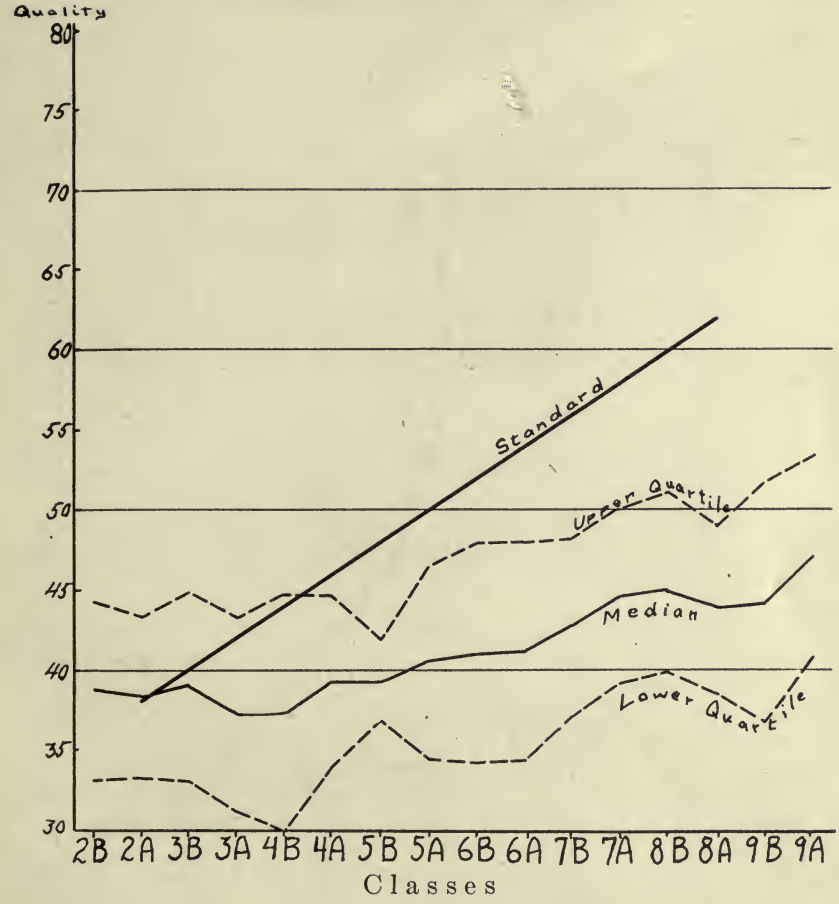
Tables I and II are tables of distribution for speed and for quality; Tables III and IV are derived tables showing the central tendencies for the several grades. It will be seen from a study of the figures in Tables III and V, and the graph in Diagram I, that the children of Berkeley excell to a marked degree in speed from the fifth grade on. In the Intermediate schools this superiority in speed is very marked; even the median of the lower half of the children is superior to the standard as set up by Ayres. (Note the position of the lower quartile in relation to the standard curve in Diagram I.) The Ayres Standard, moreover, is approximately the average of the ability of a great many thousand children; it is widely recognized as a satisfactory working standard.

Diagram I. Speed in Handwriting



Exactly the opposite condition is found to exist in regard to quality of handwriting. The median attainment for Berkeley children is decidedly below the Ayres Standard after the low third grade (Tables IV and VI). A more striking feature of the situation, however, is revealed by a study of Diagram II, which is based upon the figures of Tables IV and VI. The median attainment in the Berkeley low second grade is 39 (on the Ayres Scale) and in the low ninth it is only 49—an improvement of ten points. According to standards widely accepted throughout the country the attainment for the eighth grade and beyond

Diagram II. Quality in Handwriting.



ought to be at least 63 or 64. Diagram III, which is based upon the figures of Tables V and VI, shows the facts of the situation by the two-co-ordinate method. Whereas the Standard attainment in quality progresses regularly from 38 to 62, and whereas the curves for St. Louis and for Richmond approximate this curve, Berkeley fails to get beyond the 50 mark at any point. On the other hand, the superiority in speed stands out very clearly. Apparently the children of Berkeley write faster than other children—and with greater illegibility. For the teaching force the problem facing them would seem to be very clear: emphasis needs to be placed upon formation and excessive speed should not be allowed to destroy legibility. It has often been stated that a happy medium must be found between the two, and the recommendation seems to strike home in Berkeley with particular force.

DIAGRAM III. SPEED AND QUALITY HANDWRITING

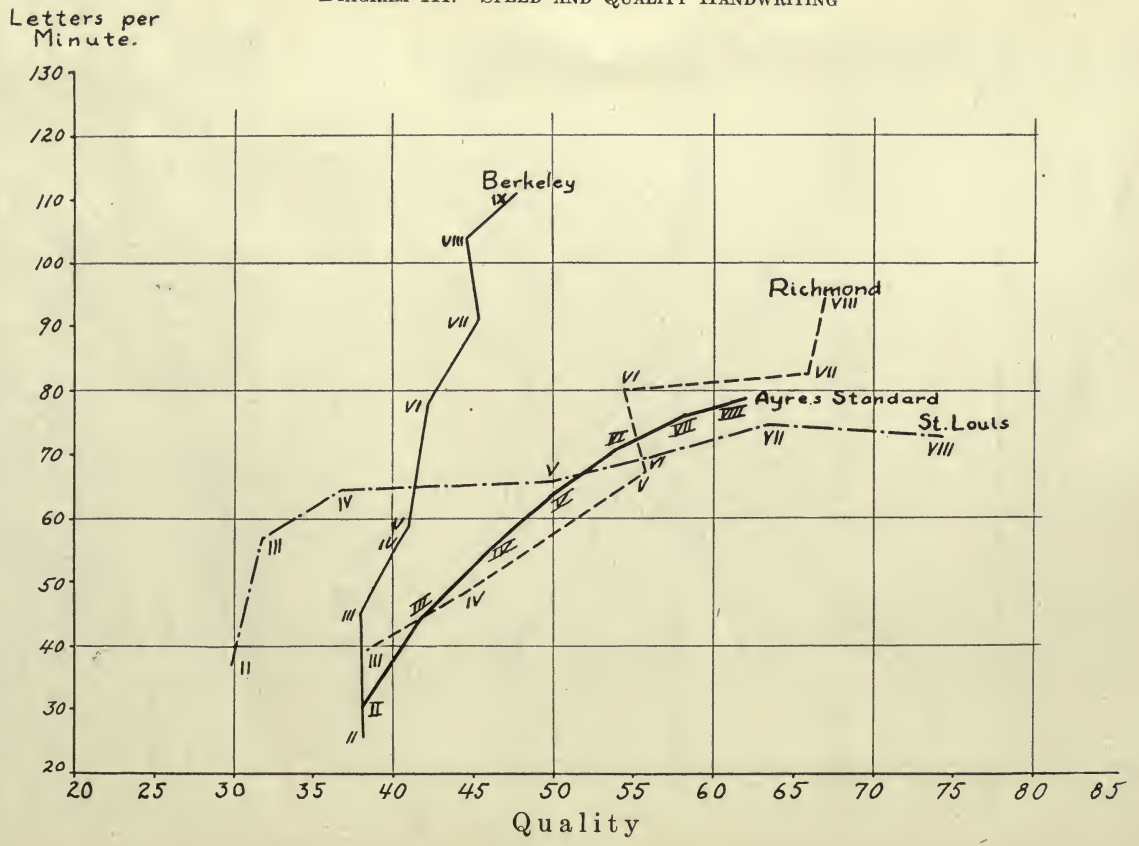
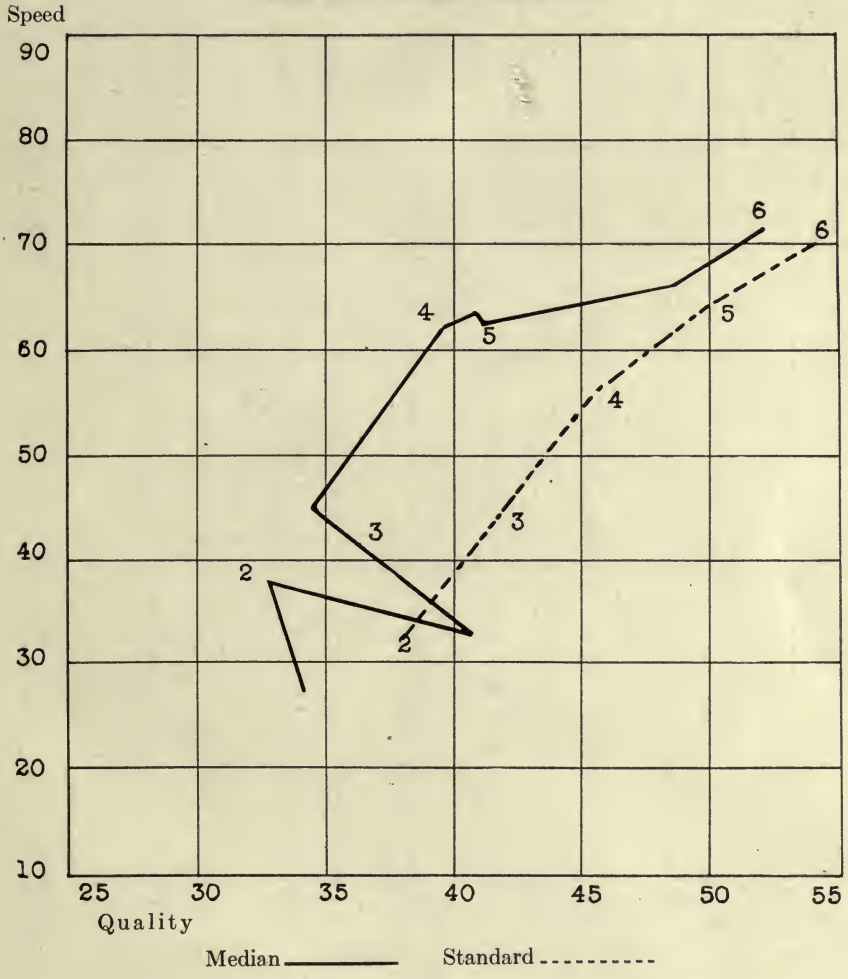
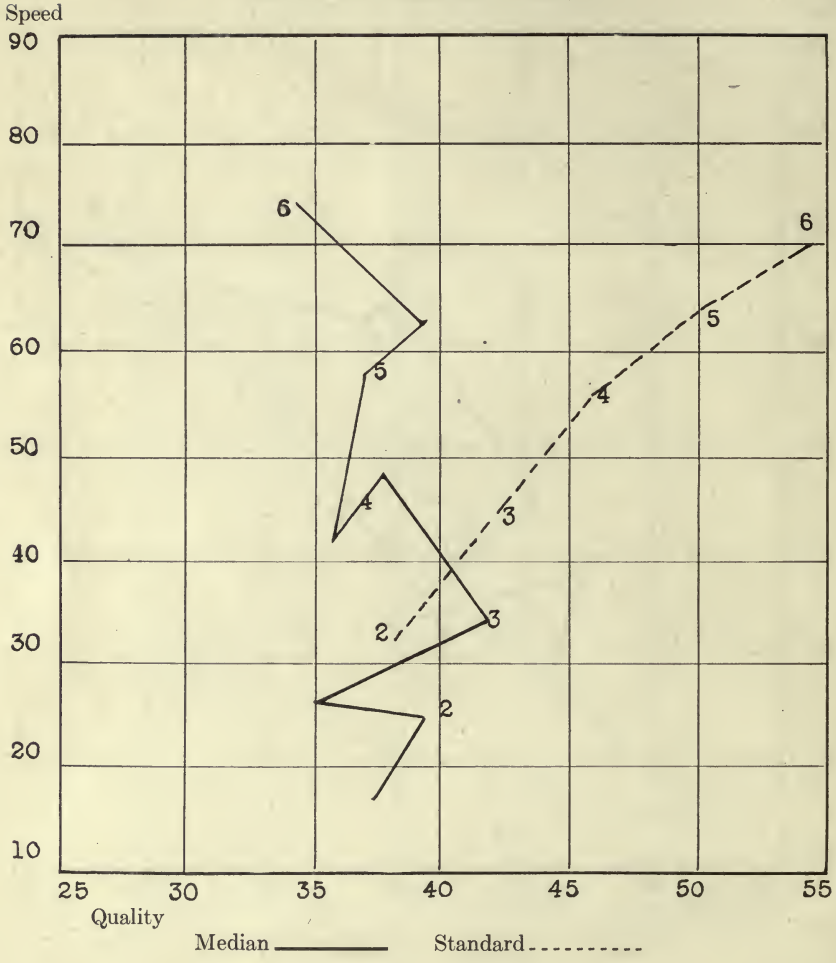


DIAGRAM IV. WASHINGTON SCHOOL



It may be noted in passing that the lack of drill in letter formation —and the process of producing writing—is also apparent in the lack of any pronounced similarity in the handwriting of the Berkeley children. This factor cannot be shown in any tables, but was noted again and again by members of the Seminar. Whereas in many systems where writing is extensively taught and supervised,—in short, where there is a strong central direction in the subject of penmanship,—there is naturally a very considerable degree of uniformity of style and size of letters, in Berkeley there is a lack of any uniformity, unless the tendency to a very small writing may be deemed a type of uniformity.

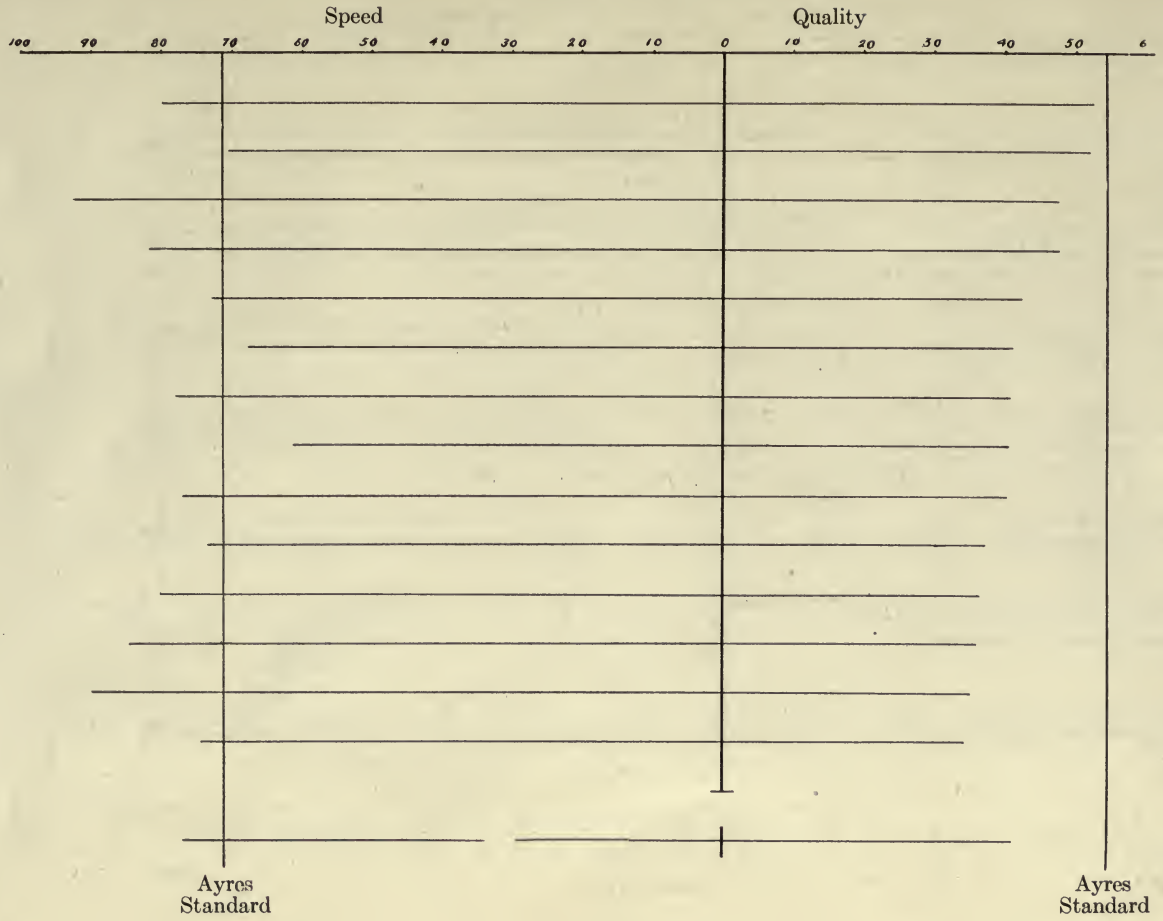
DIAGRAM V. McKINLEY SCHOOL



It would seem, then, that the problem of penmanship teaching in Berkeley is clear-cut: greater attention to the *process* of writing and the development of good legible forms, with very little stress, for the present, upon speed. Schools, no doubt, have sometimes made the mistake of striving to attain a degree of excellency in form not consistent with the proper expenditure of time and effort on the part of teacher and pupil, but the world at large needs and uses a standard of writing as good as quality 50 and in special lines of work, above 60.* The public schools should at least develop that degree of speed and quality which the

*See No. 14 in Selected Bibliography.

DIAGRAM VI. HIGH SIXTH CLASS



*No High Sixth Class

Diagram VII

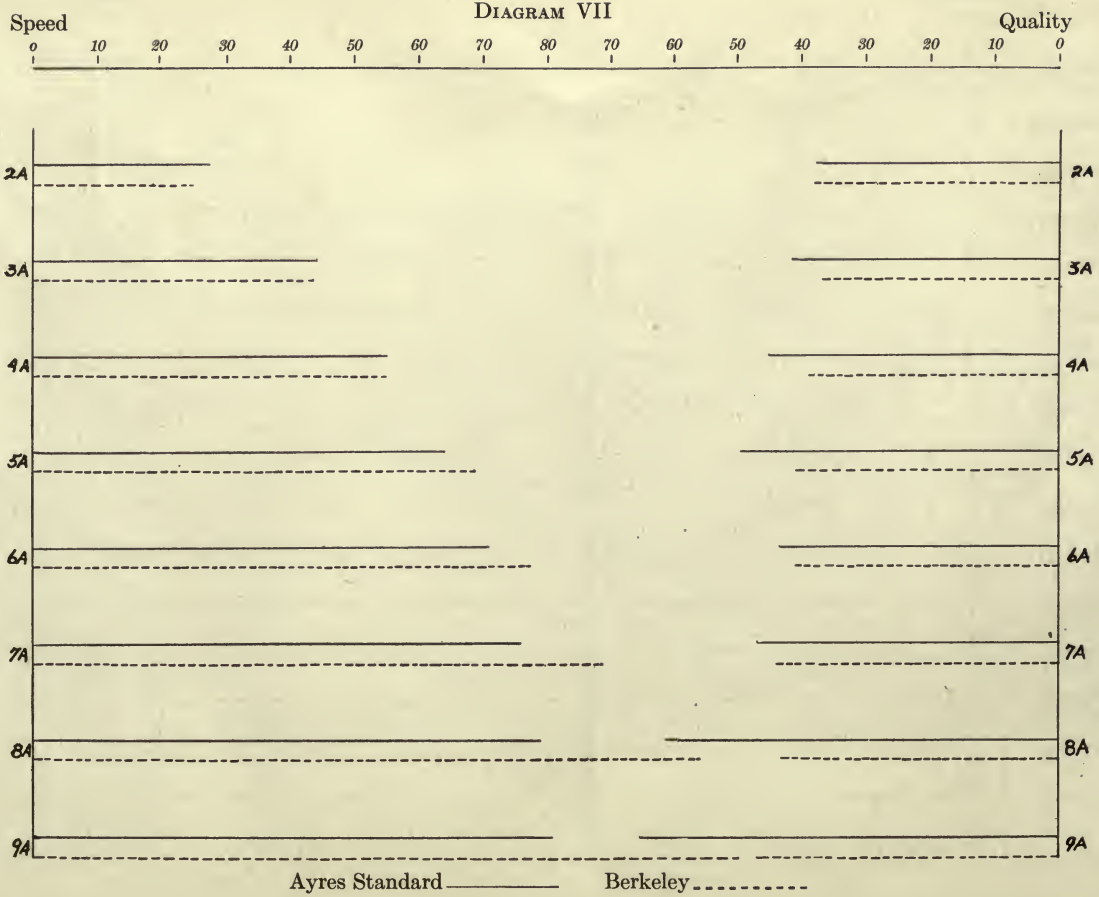
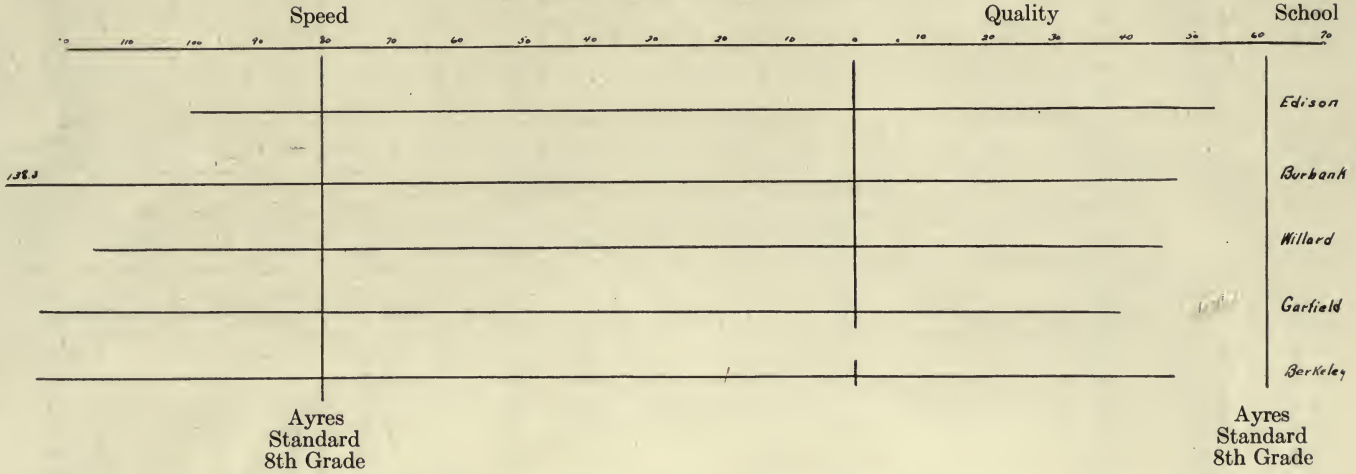

Speed
0 10 20 30 40 50 60 70 80 70 60 50 40 30 20 10 0
Quality
2A
3A
4A
5A
6A
7A
8A
9A
Ayres Standard
Berkeley

DIAGRAM VIII

HANDWRITING

High Ninth Grade, Berkeley, California



High Ninth Classes (medians) in four intermediate schools compared with Ayres Eighth Grade standards (averages).

Table VII

Washington School

Number of Pupils in Each Grade at Each Speed

Speed	10	20	30	40	50	60	70	80	90	100		Total	Median	Quartile
2B	3	14	10	1								28	27.9	6.6
2A		3	16	13								32	38.1	5.4
3B	1	13	13	3	4							34	32.3	6.5
3A		4	20	21	3	2	1					51	40.7	6.2
4B		2	10	8	9	4						33	45.6	9.5
4A		1	0	10	7	7	9	2	2			38	61.4	12.7
5B			4	7	14	23	13	2	2			65	63.3	8.8
5A			1	5	9	11	6	1	2			35	62.3	8.6
6B			1	1	7	10	8	3				30	66.0	8.3
6A			1	0	2	9	7	3	0	3		25	70.7	8.0
Total.....	4	37	76	69	55	66	44	11	6	3		371		

Number of Pupils in Each Grade at Each Quality

Quality	10	20	25	30	35	40	45	50	55	60	65	70		Total	Median	Quartile
2B		1	1	14	5	6	1							28	34.3	4.1
2A	1	5	3	12	3	8								32	33.0	5.9
3B			1	3	11	11	4	2	1	1				34	40.9	4.0
3A			6	14	20	8	3							51	36.4	3.6
4B			6	11	6	5	3	2						33	34.8	7.7
4A			1	7	12	9	4	3	2					38	39.6	4.6
5B		1	1	9	18	19	7	3	4	3				65	40.9	3.9
5A			4	6	6	9	4	2	3	1				35	41.0	6.4
6B					2	8	7	7	3	2	0	1		30	48.6	5.2
6A						5	6	3	7	2	1	1		25	52.1	6.2
Total.....	1	7	23	76	83	88	39	22	20	9	1	2		371		
								15 per cent								

Table VIII

McKinley School

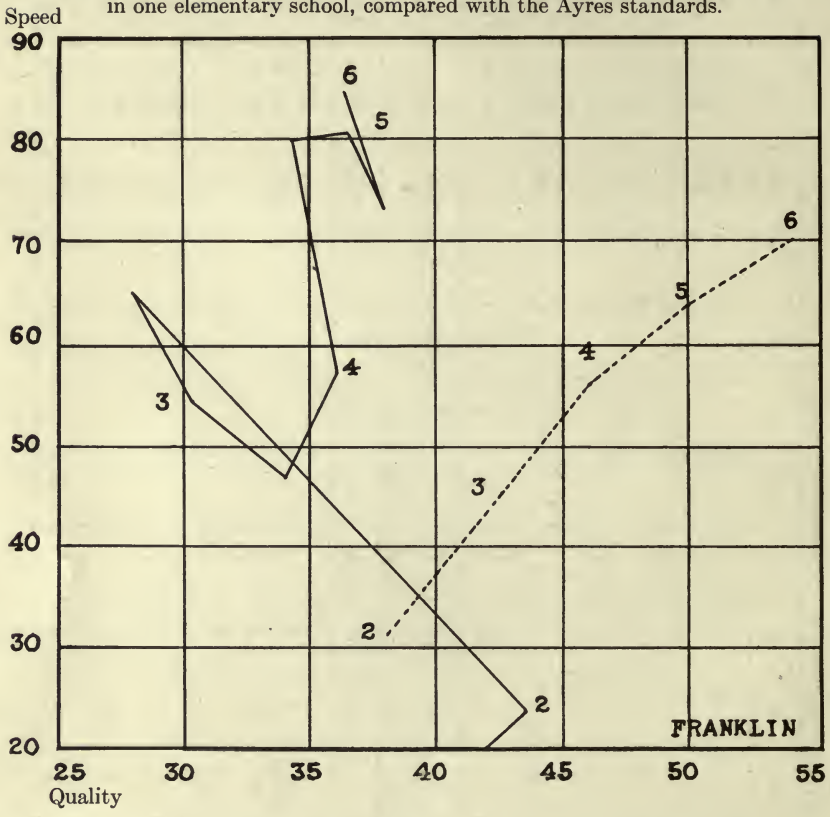
Number of Pupils in Each Grade at Each Speed

Speed	10	20	30	40	50	60	70	80	90	100	110	120	130	Total	Median	Quartile
2B	10	5												15	17.5	4.9
2A	5	8	4	1										18	25.0	6.1
3B	1	9	4											14	26.7	3.2
3A		6	6	3	2									17	34.1	7.7
4B		1	5	6	3	5	2							22	48.3	7.0
4A			5	7	2	1	1							16	44.3	6.0
5B		8	8	10	5	4								35	41.5	9.8
5A		2	0	4	5	5	2	2						20	58.0	10.3
6B				10	4	6	7	2	1	0	0	1		31	62.5	13.4
6A				4	7	5	5	8	1	4	0	1	1	36	74.0	12.1
Total.....	16	39	32	45	28	26	17	12	2	4	0	2	1	224		

Number of Pupils in Each Grade at Each Quality

Quality	10	20	25	30	35	40	45	50	55	60	65	70		Total	Median	Quartile
2B			1	4	6	1	2	1						15	37.1	3.9
2A				2	8	6	2							18	39.4	3.2
3B			1	6	3	1	0	1	2					14	35.0	5.2
3A		1	2	2	1	8	2	1						17	41.6	4.6
4B			3	4	8	5	2							22	37.5	3.7
4A				7	4	5								16	36.3	4.1
5B		3	6	7	11	2	3	2	1					35	35.7	5.1
5A			1	8	3	4	2	2						20	36.7	5.7
6B			2	4	11	8	4	2						31	39.3	3.0
6A	1	1	7	10	7	3	3	3	1					36	34.5	5.9
Total.....	1	5	23	54	62	43	20	12	4					224		
								7 per cent.								

DIAGRAM IX. Speed and Quality of Handwriting of pupils, grades 2 to 6, in one elementary school, compared with the Ayres standards.



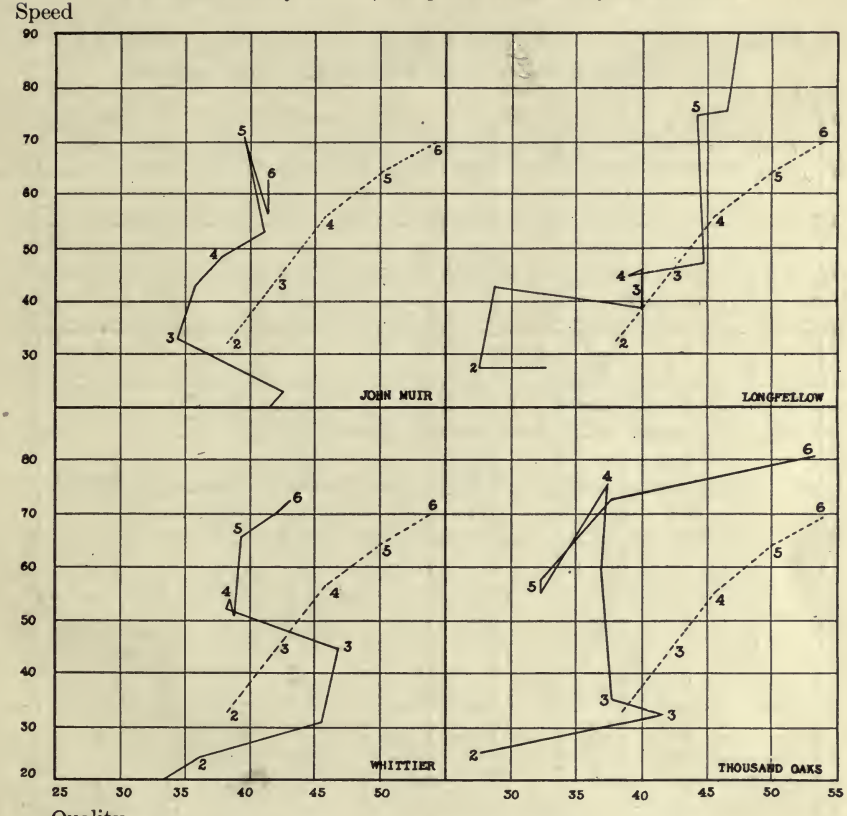
average person is to use in after life. The need of the specialist may well be considered a vocational problem, but the need of the masses is the creed of the school.

COMPARISON OF TYPICAL SCHOOLS

Tables VII and VIII are tables of distribution for speed and quality in two typical schools, the Washington and McKinley. The Washington represents the type approaching more nearly the standard curve for both speed and quality, and the McKinley, the type with the greatest deviation from the standard curve.

It will be seen from a study of the figures in these tables that the pupils in both schools in speed and also quality approximate closely in their distribution, a normal probability curve. However, the range in speed of the McKinley pupils is much greater than that of the

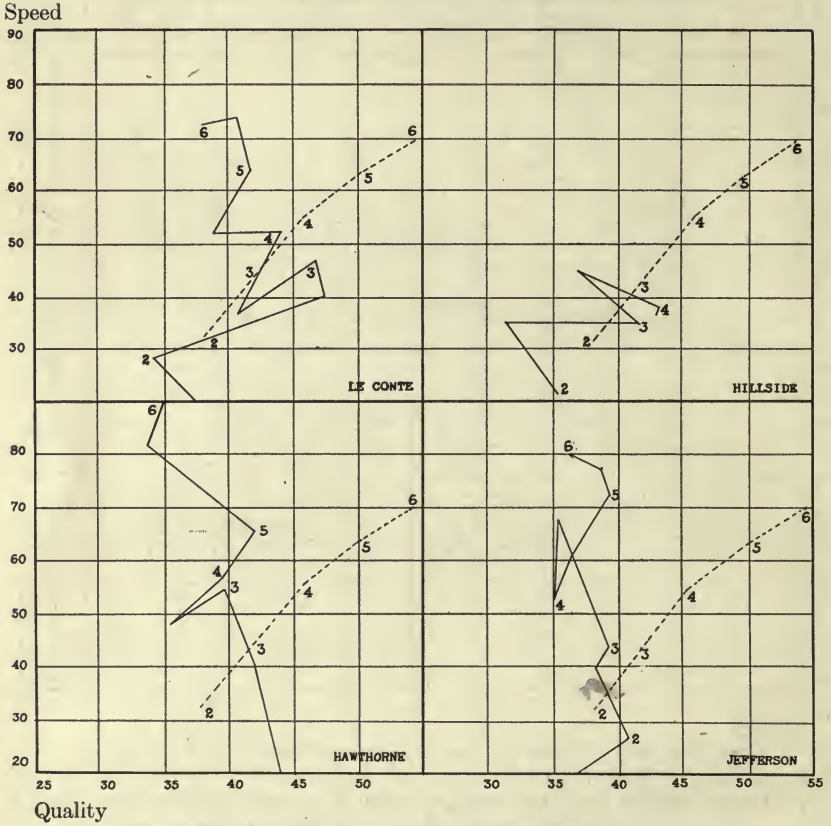
DIAGRAM X. Speed and Quality of Handwriting of pupils, grades 2 to 6, in four elementary schools, compared with the Ayres standards.



Washington pupils, but the range in quality is considerably less. Also it will be seen that only 7% of the pupils in the McKinley school score (on the Ayres scale) 50 or above, a standard shown by Koos in a recent study to be high enough to meet the needs of the world at large. While in the Washington school 15% of the pupils have attained that standard. Diagrams IV and V show in a graphical form the medians of grades 2B to 6A inclusive in both schools compared with the Ayres standard curve. Similar data for all remaining schools are pictured in Diagrams IX, X, XI, XII, XIII.

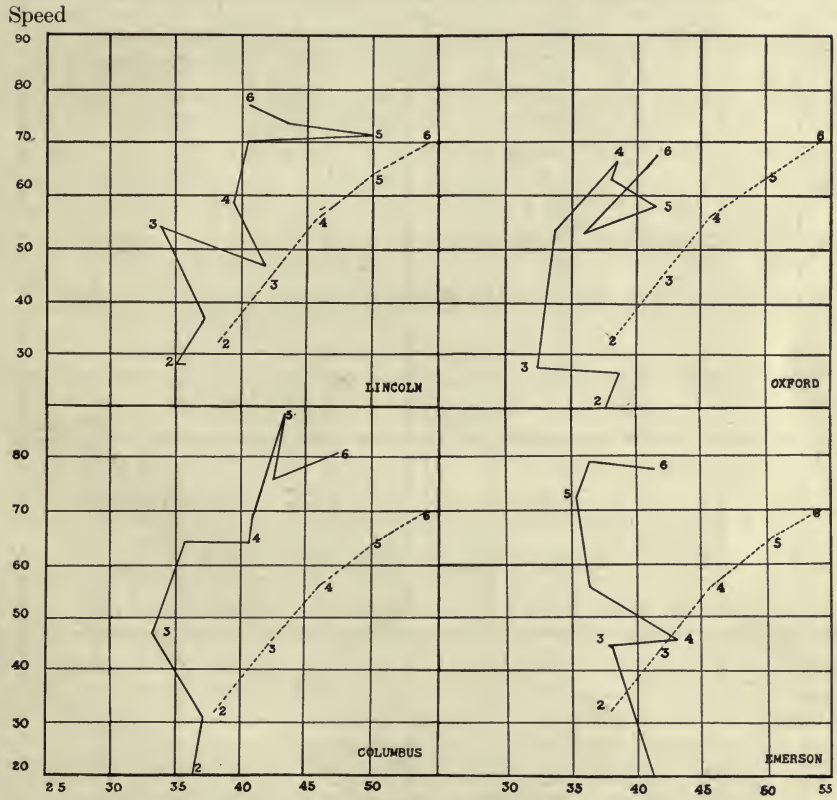
In an elementary school comprising the first six grades it seems fair to assume that the attainment of the high sixth class is typical of the school, therefore Diagram VI is included in this survey for the purpose of making a comparative study of the various schools in the city. Diagram VIII pictures the same data for the Junior High Schools.

DIAGRAM XI. Speed and Quality of Handwriting of pupils, grades 2 to 6, in four elementary schools, compared with the Ayres standards.



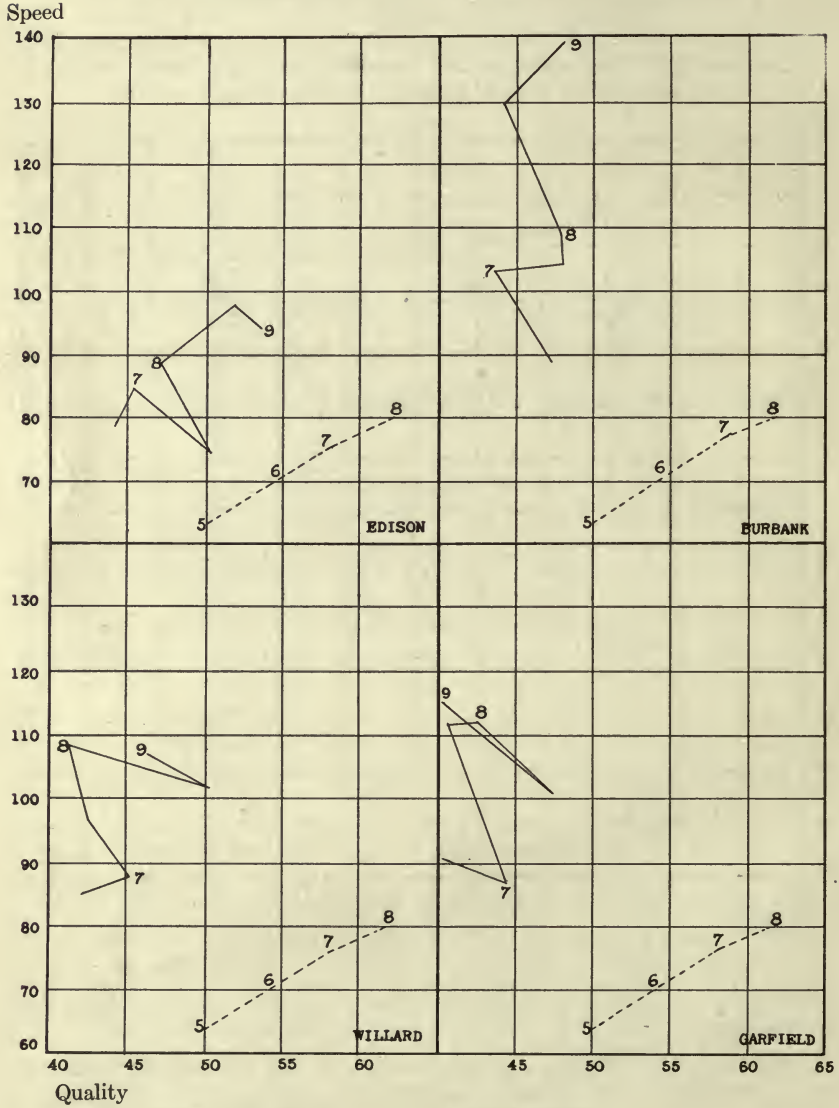
In Berkeley where the speed in all grades above the fourth in most of the schools is much beyond the standard it would seem to be the problem of such schools to lay great stress upon the development of quality even at the expense of speed if quality has not kept pace with speed. Diagram VII shows in a marked way to what an extent speed has been developed in the Berkeley schools in all grades at the expense of quality.

DIAGRAM XII. Speed and Quality of Handwriting of pupils, grades 2 to 6, in four elementary schools, compared with the Ayres standards.



(Berkeley Medians_____; Ayres Averages - - - - - - - -)

DIAGRAM XIII. Speed and Quality of Handwriting of pupils, grades 7 to 9, in four intermediate schools, compared with the Ayres standards.



(Berkeley Medians_____; Ayres Averages - - - - - - - -)

For the sake of those who may be interested in reading for themselves concerning the status of writing as revealed in current educational comment the following brief bibliography is appended.

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CHAPTER II

REPORT OF THE COMMITTEE ON SPELLING

Material for the Test and Plan of Giving

On March 13, 1919, at the same hour in a given school, the pupils from the low second to the high ninth grades inclusive were asked to spell twenty words. The words were chosen from the Ayres Measuring Scale for Ability in Spelling. It has been found that classes make, on the average, a grade of 73 per cent. when they attempt to spell these words. These lists were the same that were dictated to the children of the Cleveland Ohio Survey. Several days before the day of the test the principals and teachers received the following bulletin of instructions from the office of the Superintendent:

Instructions Concerning Spelling Tests

Berkeley, California,
March 12, 1919.

To Principals and Teachers:

On Thursday, March 13th, a representative of Professor Mead's Seminar will come to your school for the purpose of giving, or assisting the teachers in giving, a test in spelling from the second to the ninth grades inclusive. Lists of words will be provided by the above representative. Do no "teaching" of the words. Provide your class with such material as they regularly use in a spelling lesson. See that each pupil writes his name, date, grade (A or B), and school. Dictate the spelling list as you would ordinarily in a written spelling period. If necessary, you may use a word in a sentence in order to make clear its meaning. Have the pupils spell, however, only the word. Collect and immediately mark all papers on the percentage basis, writing the score in the upper right hand corner, deducting five per cent. for each misspelled word. An omitted word should be counted as an incorrect spelling. Attach the spelling list to the papers and hand the same, properly clasped, to the representative. It is important that this test be given Thursday, preferably Thursday morning. Please see that the above directions are followed implicitly.

Very truly,
H. B. Wilson,
Superintendent of Schools.

Oral Instructions

In addition to this, the representative was authorized to give such oral instruction to the teachers as seemed necessary for a clear understanding of what they and the children were expected to do. The most important of these oral directions were:

1. Not to tell the children they were taking a "test."
2. Dictate at the usual writing speed of the class.
3. The teacher to number the words as they were dictated.
4. If the pupil began a word incorrectly, then changed it, it was to be counted right, if correctly done at last, if the teacher was sure the word was not copied.

Tabulation of Results

The papers were collected and marked by the teachers, then turned over to the waiting representative who later revised the gradings. It was interesting to discover that almost as many papers had, in the haste of marking, been marked too low as too high. Where some percentages had to be lowered five or ten points, others had to be raised ten or fifteen. The spelling committee advises, that in the test of next term, more time be allowed for this part of the teachers' work.

The score of each grade was tallied on sheets like the accompanying form which shows the record for a typical A sixth grade, and upon these sheets was computed the correction on the guessed average to get the true average.

The grade scores and averages were assembled upon two different forms. One form showed the scores and averages for each grade in a particular school; the other form showed the scores and averages of the same grade in all the schools. Upon the totals found upon each sheet, the committee has computed the guessed and true average, the average deviation, the median, and the quartile deviation. The number of computations on each sheet was fourteen. Where there were several classes of a grade, as for example, six in the high seventh of the Willard School, the computations were increased to the number of twice the additional divisions. The thirty-five sheets necessary to formulate this report represent a total of four hundred ninety computations without the additional pairs made necessary by the three, four and six-fold divisions of several grades. This will explain the fact that several months passed before the results of the tests were made accessible to teachers.

TYPICAL SCORE, SIXTH A GRADE

Spelling

0		
5		
10		
15		
20		
25		
30		
35	2	
40		
45		
50	3	
55	1	
60		
65	2	
70	1	
75	2	
80	1	
85	2	
90	2	
95	2	
100	1	
N.	19	
Guessed Av.	77.5	
True Av.	73.3	

Factors to be Considered in Interpretation of Results

Before discussing the tabulations and graphs, attention is invited to the following facts:

The test was given on March 13, four weeks and three days after the mid-year promotions which were made on February 10. The achievement of Berkeley as a whole is not, therefore, entirely comparable with that of those cities where the test was given at the mid-year period. In other words, the B section of every grade was much nearer to the A section of the grade below, than to the A section of their own grade.

The second thing that must be taken into consideration in interpreting Berkeley's record is that there was an enforced vacation due to the influenza totaling nine weeks. For purposes of comparison, however, the results with the B, or lower, sections were not used. The average results of the A or upper, section of each grade were used in the comparison of Berkeley with other cities. As a matter of fact then, these A sections were still about four weeks short of the mid-year.

A third point should be kept in mind. In the Berkeley Survey there was no sampling, but every spelling was used. 5814 children of the city spelled, or attempted to spell, twenty words each. The tabulations therefore represent 116,280 spellings. In no other survey, so far as known, has this been true. San Francisco was notably sampled even after the spelling was given in only a part of the schools of the city.

In another way the Berkeley Survey is unique. The entire teaching staff of the Elementary and the Intermediate Departments had an important part in it. In other cities with which Berkeley has been compared, the tests were conducted in the main by persons who were strangers to the children. In Berkeley unfamiliar personalities were not a confusing element. This should have induced a better performance on the part of the children. The participation of the teachers in the work brought out re-actions impossible if classes had been visited and tested by outsiders. Those re-actions are bound to result in great good to the schools because intelligent criticism and helpful suggestions are most desirable if real growth is to be secured.

Table I

Showing Distribution of Spelling Scores for Berkeley—Regardless of School

Form III.—Spelling—Berkeley Elementary Schools

Score	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	Total
0	29	8	8	2	7	....	4	....	3	1	2	....	1	....	65
5	26	9	4	1	11	....	4	1	2	....	....	....	4	....	62
10	28	19	12	3	14	3	7	5	1	....	3	3	2	....	100
15	21	8	17	3	20	5	12	6	4	2	9	2	5	3	117
20	26	15	18	2	19	9	12	8	8	2	15	3	6	4	147
25	18	10	19	6	16	6	15	16	12	6	12	11	9	8	164
30	12	10	15	3	25	19	15	18	11	6	15	13	15	6	173
35	17	12	13	12	18	26	12	18	12	7	17	9	10	7	190
40	10	10	17	13	28	19	21	25	15	8	14	17	15	23	235
45	9	19	17	10	21	27	17	21	21	10	27	15	16	17	247
50	12	17	27	20	27	21	24	22	14	17	22	30	23	24	300
55	14	21	18	25	27	34	18	31	22	11	28	19	28	19	315
60	17	19	11	18	21	29	29	36	31	24	18	29	20	20	322
65	12	22	22	14	19	40	20	29	38	21	27	23	31	30	348
70	9	18	17	15	22	31	23	21	27	30	33	39	28	23	336
75	9	18	21	32	25	31	25	34	25	36	23	43	17	30	369
80	8	24	15	25	21	27	32	32	26	40	24	43	21	29	367
85	7	30	17	31	13	27	14	35	38	54	37	33	17	37	390
90	11	24	14	48	14	27	29	39	24	55	27	45	10	41	408
95	6	31	9	44	6	37	16	23	40	52	14	36	11	33	358
100	2	27	13	29	2	20	9	19	24	39	9	26	6	15	240
Number	303	371	324	356	376	438	358	429	398	421	376	439	295	369	5253
Guessed Average	32.5	67.5	52.5	77.5	52.5	67.5	57.5	67.5	72.5	82.5	62.5	77.5	62.5	72.5	62.5
True Average	38.6	62.7	56.	74.4	51.12	66.5	60.8	66.65	69.15	78.65	62.57	72.	61.5	71.6	64.4
A. D.	24.15	24.8	23.07	18.6	21.1	18.6	21.7	19.2	19.2	15.15	18.05	17.5	17.7	17.55	21.7
Median	31.5	66.9	54.07	79.84	51.66	67.6	63.1	68.01	70.92	83.7	66.1	75.17	62.	75.8	67.7
Quartile	16.42	21.18	20.45	17.76	20.3	15.51	17.31	15.7	15.23	13.02	16.12	14.14	13.23	12.8	20.4

Table II

Average Score Made by the High and Low Sections of Each Grade in the Elementary and Intermediate Schools, Berkeley, California

	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	9B	9A	Ungraded	Average
Columbus	16.2	45.9	48.1	66.5	36.8	70.4	54	70.6	78.5	87	....	....	....	....	....	....	....	59.1
Emerson	37.5	56.5	42.5	85.2	51.3	77.8	63.8	62.2	81.3	75.8	....	....	....	....	....	....	....	65.8
Franklin	44.7	66.2	44.8	76.7	44.6	55.8	47.3	60.4	63.3	61.5	....	....	....	....	....	....	....	55.9
Hawthorne	11.9	38.2	40.1	70	40.7	44	66	70.9	70.7	81.4	....	....	....	....	....	....	....	52.1
Hillside	60.8	73.8	47	63.3	62.8	67.2	75.2	55	—	—	....	....	....	....	....	....	....	65.4
Jefferson	22.5	50.7	65	84	57.5	69	45.5	70.7	64.2	73.3	....	....	....	....	....	....	....	62.6
John Muir	32.5	72.5	53.9	79.7	56.5	64.8	58.9	60.4	66.6	79.2	....	....	....	....	....	....	....	62.9
Le Conte	69.3	61.8	64.7	75.3	65.6	62	69.1	64	69.7	78.3	....	....	....	....	....	....	....	68.6
Lincoln	56.5	81.7	76	74	51	69	73.4	72	68.7	83.1	....	....	....	....	....	....	....	69.5
Longfellow	26.4	38	33.5	74.5	56.6	63.1	74	72.6	82.4	84	....	....	....	....	....	....	47.9	62.3
McKinley	41	56.7	50.6	81.3	49	63.5	45.9	62.9	57.5	76.1	....	....	....	....	....	....	....	59
Oxford	16.9	51.1	44.9	56.3	41.1	64.8	58.1	54.2	70.5	70.8	....	....	....	....	....	....	....	56.3
Thousand Oaks	—	60.8	68.5	63.5	59.7	72.5	51.5	—	79.4	70.5	....	....	....	....	....	....	....	62.7
Washington	45.3	88.8	70.4	79.1	50.4	64.3	56.8	74.1	67.8	89.1	....	....	....	....	....	....	....	67.5
Whittier	30.5	68.1	48.7	77.9	56.9	81.1	66.5	68.6	63.5	78.5	....	....	....	....	....	....	....	66.1
Burbank	....	....	....	....	....	....	....	....	....	....	53.2	71.6	65.9	79.2	72.9	81.6	....	*68.7
Edison	....	....	....	....	....	....	....	....	....	....	70.5	75.9	59	72.9	82.2	80.8	....	*69.5
Garfield	....	....	....	....	....	....	....	....	....	....	67.6	72.8	64.3	75.8	72	80.7	....	*70.2
Willard	....	....	....	....	....	....	....	....	....	....	59.1	68.8	59	66	70.2	76.4	....	*64.7
Average	36.6	60.7	53.2	73.9	52.0	65.9	60.4	65.6	65.6	75.2	62.6	72.3	62.1	74.2	74.3	79.9	....	†69.7

* Average for Intermediate Schools for Seventh and Eighth Grades only. (These averages were made from the total distributions, not an average of averages).

† 69.7 Average of averages for A Divisions 2 to 8 inclusive.

Table III

Table of Averages—A Sections

(Averages of Averages)

	Grade II	Grade III	Grade IV	Grade V	Grade VI	Grade VII	Grade VIII
Standard	73	73	73	73	73	73	73
Berkeley	60.7	73.9	65.9	65.6	75.2	72.3	74.2

Interpretation of Results

Table I (Distribution of Spelling Scores for Berkeley, Regardless of Schools) shows the total number of distributions of each measure for the different grades throughout the Berkeley system. For illustration: out of the 371 pupils in the A second grade, 27 made a score of 100 per cent., while the entire number of second grade pupils made an average of 62.7 per cent.

Table II (Average Score made by the High and Low Sections of Each Grade, according to schools) when read horizontally shows the class average of each school for each of the grades and also the average for the school. When read perpendicularly, it shows the average by grades in each school and for the system.

Table III (Table of Averages) represents the averages of the class averages, by grades, in the entire system regardless of schools. Thus the average of all the second grades (A Div.) in Berkeley is 60.7 per cent.

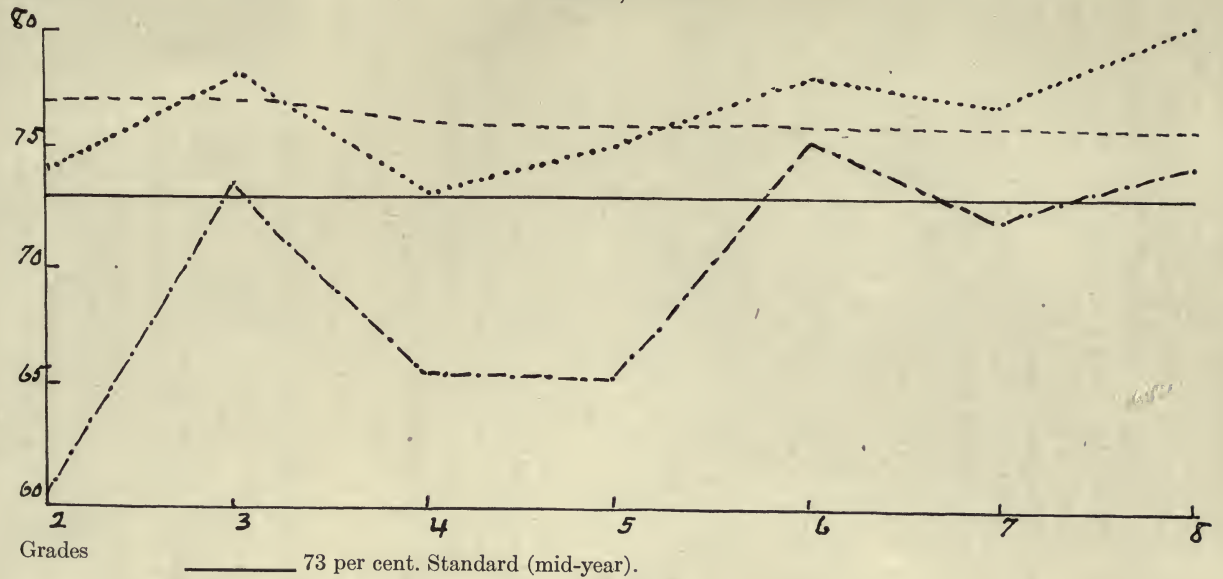
The averages pictured in Chart I (Averages of Averages) show that the Berkeley Schools, as a whole, are a little above the 73 per cent. score in the third, sixth and eighth grades, but that the second, fourth and fifth grades fall surprisingly low, while the seventh closely approximates the 73 per cent. point. The equality of the fourth and fifth grades in negative ability is significant and gives rise to several questions regarding the causes for the condition. The average for the entire City of Berkeley is 69.7 per cent.

A comparison of Berkeley's record with that of Cleveland brings out the fact that in both cities good and poor spelling ability lies, relatively, in the same grades. The very low attainment of the second grade is probably due to two facts: (1) spelling as a subject is not regularly taught in all the first grades; and (2) in nearly all the classes the second grade children were using paper and the pencil as a medium for the first time on the day of the test. We do not understand the low scores of the fourth and the fifth grades. Since the same grades in Cleveland occupy the same relative position, there is perhaps some unknown factor that influenced the achievement in both cities. This suggests further study.

CHART I

BERKELEY PUBLIC SCHOOLS

Average Score in Spelling Made by A (High) Section of Each Grade from the Second thru the Eighth. March, 1919.



———— 73 per cent. Standard (mid-year).

—·—·— Berkeley, four weeks short of mid-year.

– – – – – – Standard 1or both A and B sections, at close of year, when A sections are completing grade. (See Cleveland Survey, pages 243-244.)

. . . . . Cleveland. (Both sections at close of year.)

Not only is there a wide difference between the same grades of the different schools in Berkeley, but the range within the individual schools is in some instances very large. The variation in the averages made by the different grades in the Berkeley Schools, as shown in Table II, is from 60.7 per cent. in the second grade to 75.2 per cent. in the sixth, a variation of 14.5 per cent. In Cleveland the range is from 73 to 80 per cent., a variation of only 7 per cent. In the Elementary group, the school having the greatest range shows a spread from 16.2 per cent. in the B second to 87 per cent. in the A sixth. The one showing the least variation extends from 61.8 per cent. to 78.3 per cent. In the Intermediate group, (seventh and eighth grades only) the same thing is true. The greatest range is from 53.2 per cent. to 79.2; the least from 59 to 68.8 per cent. The fourth grades (A Div.) which average 65.9 per cent. have a reach from 44 per cent. to 81.1 and the fifth grades (A Div.) which average 65.6 per cent. offers 54.2 per cent. as the lowest grade average, and 74.1 as the highest.

To arrive at a more definite conclusion regarding the causes of this condition, detailed studies of the causes of pupils' misspellings would have to be made. Such a study is suggested by Monroe in "Measuring the Results of Teaching," pages 192 to 202.

Time has not permitted this, therefore the Committee is not willing to hazard an opinion. One thing however does seem to be indicated, and that is, that there is too much attention given to the spelling of mere lists of words which the pupil may already know, and not enough to systematic development of the ability to attack a new word. Inattentive application to what one already knows produces a mental apathy which can soon become a fixed habit.

Recommendations

In view of the fact that a more complete diagnosis cannot be made at this time, the Committee is limited in the kind and the number of the recommendations that it can make. The first and the most important from the Committee's point of view is that a copy of each grade and school sheet, a copy of the tables of averages, and of the graph, be furnished to every school in each group and that the schools themselves study these results and endeavor to arrive at a conclusion which may be passed on to the teaching staff in order that a better and more uniform quality of work may be done in the grades.

To facilitate and illumine the study of these tabulations and graphs, we recommend that the Board of Education supply each school with one or more copies of the following books:

The Eighteenth Year Book, (the 1919 issue), in which there are forty-one principles of method in spelling presented as the last word from the Committee on Economy of Time in Education. This same Yearbook contains similar principles of method in reading, writing and arithmetic.

MONROE: *Measuring the Results of Teaching.* Houghton Mifflin Company.

TIDYMAN: *The Teaching of Spelling.* World Book Company

PEARSON and SUZZALLO: *Essentials of Spelling.* American Book Company

There is now in the hands of the Elementary teachers, and it should be in the Intermediate grades, a copy of the California Teacher's Manual of Spelling. This offers illuminating material for the teachers' guidance. An extensive bibliography is also listed in the Eighteenth Yearbook, to which attention is directed.

To facilitate the movement for an improvement in spelling ability, the Committee offers the following suggestions taken from the investigations previously mentioned and recommends that they be put into the hands of each teacher and acted upon immediately.

The Committee sees two phases of the matter, and has arranged the recommendations under two headings. For the teacher we submit guidance in the methods of teaching spelling. For the pupil—to be taught to him by the teacher—directions for the method of studying spelling.

I. Guidance in the Method of Teaching Spelling

1. The time, 15 minutes daily, devoted to spelling, should largely be spent on class instruction under the direction of the teacher; in other words, it should be devoted to *teaching* rather than to *testing*.

2. Any good plan of teaching may be followed. Suzzallo and Pearson in their recent text, "Essentials of Spelling," present the following excellent procedure:

a. Write the new word in its normal form on the blackboard. (Make use of the visual sense).

b. While writing it, pronounce it distinctly.

c. Develop the meaning orally, by calling on the pupil for a sentence using the word, or by giving yourself a sentence, or by defining the word.

d. Show the syllables into which the word is divided, either by drawing vertical lines between the syllables (or lines under), or by covering the word so that but one syllable at a time is seen. Call upon the pupils to spell orally by syllables. (It is well to have the pupil form the habit of clearly pronouncing the word before and after spelling.) Have them indicate the part of the word that presents difficulties or the part that they already know.

e. Have the pupils write the word on practice paper several times, spelling it quietly as they write.

f. Allow the class a moment in which to look at the word again, then close the eyes and try to visualize it.

g. Provide plenty of repetition for drill, oral and written. (Some teachers give their pupils four or five minutes, say, to "study" their written word lists, after teaching, then have the class turn their papers over to spell from rapid dictation, this to determine the daily spelling grade).

3. For interesting methods of drill, the group contest in spelling games is recommended. S. A. Courtis' *Teaching Spelling by Plays and Games*, (82 Eliot St., Detroit) contains explicit directions for a number of such.

4. Teach the pupil to correct his own errors.

5. *Insist upon careful spelling in all written work.*

The committee wishes to emphasize the following negative matters in method:

1. Do not require a pupil "to write a word ten, fifteen or twenty times mechanically." Repetition should be accompanied by attention, and the teacher should know that such is the case.
2. Do not permit children to correct one another's spelling.
3. Do not call attention unnecessarily to the wrong wordform. For example, never say, "Do not use two l's in until." Say rather, "Notice the one l in until."
4. Do not drill upon words the children already know and do not drill upon all words alike.

II. Directions to be followed in Studying Spelling

The California Manual for the Teachers on page 8 says: "It is much more important that the child should know how to study new words than that he should be forced arbitrarily to memorize any fixed series of words." The teacher should then see that he knows how to study spelling. Excellent directions are to be found in the *Children's Preface* of the new California State Series of Spellers, and the teacher should see that each pupil understands and uses that method or some one equally good.

The pupil should be taught to keep in a note book an alphabetical list of the words which trouble him and his study of spelling should be directed to the mastery of his own difficulties.

Pupils should be taught now to use the dictionary in the study of spelling and then required to use it.

Pupils should acquire and be encouraged to use correct pronunciation as an aid to correct spelling.

As in the process of teaching there are some things one should not do, so in the process of learning there are some "do not's." Among them the following are to be stressed:

1. Do not *guess* at a spelling. Use the dictionary or ask the teacher.
2. Do not waste time in studying words you already know.
3. Do not write a word over and over without thinking about it. Write it a fewer number of times saying it quietly to yourself as you write.
4. Do not neglect to correct every misspelling in every piece of writing that you do.

The committee urges, that in the effort to raise the standard of ability, there be no increase of time allowance for spelling. It seems to be established conclusively that fifteen minutes daily is ample time if the methods followed are good. More time than that has not been shown to be more productive of power.

In conclusion the committee desires to say that in its opinion the emphasis should not be laid so much upon the fact that Berkeley did not do well, but upon the fact that it could do better. The only value that the survey can have is to stimulate to new and more intelligent efforts.